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Education:

2000 *Ph.D. in Applied Physics, University of Michigan*

- Dissertation: Near-Field Coherent Optical Spectroscopy and Microscopy of a Mesoscopic Quantum System

- Advisor: Duncan G. Steel

1997 *M.S. in Applied Physics, University of Michigan*

1993 *B.S.E. in Engineering Physics (Mechanical), Princeton University*

Research Experience:

2004- *Arthur Holly Compton Post-Doctoral Fellow, Argonne National Laboratory, Physics Division*

2000- *Post-Doctoral Fellow, University of Michigan, Dept. of Physics* (G. Raithel)

1995–2000 *Research Assistant / Dissertation, University of Michigan, Dept. of Physics* (D. G. Steel)

1994–1995 *Research Assistant, University of Michigan, Institute of Gerontology, Biophysics* (D. G. Steel)

1994 *Research Assistant, University of Michigan, Center for Ultrafast Optical Science* (P. H. Bucksbaum)

1993 *Research Assistant, Princeton Plasma Physics Laboratory* (S. Suckewer)

1992 *Research Assistant, Princeton University, Mechanical & Aerospace Engineering* (R. B. Miles)

Teaching Experience:

1998- *Laboratory supervision of more than 15 graduate and undergraduate students*

1997 *Teaching Assistant, University of Michigan*

- Graduate level quantum mechanics

Professional Memberships, Service and Awards:

2004 *Arthur Holly Compton fellowship, Argonne National Laboratory*

2004 *'Speaker of the Year' Award, 2003 FOCUS Research Seminars*

2004- *Referee, Physical Review Letters*

2003- *Org. committee, FOCUS Workshop on "Building Computational Devices using Coherent Control"*

2003- *Referee, Physical Review B*

2003- *Referee, Physical Review A*

2002- *Referee, Applied Physics Letters*

- 1996- *Member, American Physical Society*
 1994- *Member, American Association for the Advancement of Science*
 1993 *Graduated with Honors, Princeton University*

Community Outreach:

- 2002 *Presenter, University of Michigan ‘Saturday Morning Physics’ public lecture series*
 • “Fingerprints of quantum mechanics”, “The coldest place in the universe”, “Making waves, slowing light, and keeping time”
 1997 *Instructor, University of Michigan ‘Summer Science for Girls’ program*

Refereed Publications:

1. J.-H Choi, **J. R. Guest**, E. Hansis, A. P. Povilus, G. Raithel, “Magnetic trapping of long-lived Rydberg atoms”, *in preparation*.
2. J.-H Choi, **J. R. Guest**, E. Hansis, A. P. Povilus, G. Raithel, “Effects of Landau quantization observed in cold, strongly magnetized Rydberg atoms”, *in preparation*.
3. T. Cubel, B. K. Teo, V. Malinovsky, **J. R. Guest**, A. W. Reinhard, B. Knuffman, P. R. Berman, G. Raithel, “Coherent population transfer of ground state atoms into Rydberg states”, *submitted*.
4. E. Hansis, T. Cubel, J.-H. Choi, **J. R. Guest**, and G. Raithel, “A simple pressure-tuned Fabry-Perot interferometer”, *Rev. Sci. Inst.* **76**, 033105 (2005).
5. **J. R. Guest**, J.-H Choi, E. Hansis, A. P. Povilus, G. Raithel, “Laser cooling and magnetic trapping at several Tesla”, *Phys. Rev. Lett.* **94**, 073003 (2005).
6. A. P. Povilus, S. E. Olson, R. R. Mhaskar, B. K. Teo, **J. R. Guest**, G. Raithel, “Time-averaging of multi-mode optical fiber output for a magneto-optic trap”, *J. Opt. Soc. Am. B* **22**, 311 (2005).
7. A. Walz-Flannigan, **J. R. Guest**, J.-H Choi, G. Raithel, “Cold Rydberg gas dynamics”, *Phys. Rev. A* **69**, 063406 (2004).
8. B. K. Teo, D. Feldbaum, T. Cubel, **J. R. Guest**, P. R. Berman, G. Raithel, “Autler-Townes spectroscopy of the $5S_{1/2} - 5P_{3/2} - 44D$ cascade of cold ^{85}Rb atoms”, *Phys. Rev. A* **68**, 053407 (2003).
9. **J. R. Guest**, G. Raithel, “High-lml Rydberg states in strong magnetic fields”, *Phys. Rev. A* **68**, 052502 (2003).
10. **J. R. Guest**, J.-H. Choi, G. Raithel, “Decay rates of high-lml Rydberg states in strong magnetic fields”, *Phys. Rev. A* **68**, 022509 (2003).
11. **J. R. Guest**, B. K. Teo, N. V. Morrow, G. Raithel, “Magnetization behavior of atoms in gray optical lattices”, *J. Opt. Soc. Am. B* **20**, 942 (2003).
12. **J. R. Guest**, Xiaoquin Li, T. H. Stievater, D. G. Steel, D. Gammon, D. S. Katzer, “Direct probing of quantum dots through linear and nonlinear nano-optics”, *Phys. Stat. Sol. B* **234**, 435 (2002).
13. **J. R. Guest**, T. H. Stievater, Xiaoquin Li, Jun Cheng, D. G. Steel, D. Gammon, D. S. Katzer, D. Park, C. Ell, A. Thranhardt, G. Khitrova, H. M. Gibbs, “Measurement of optical absorption by a single quantum dot exciton”, *Phys. Rev. B* **65**, 241310R (2002).

14. B. K. Teo, **J. R. Guest**, G. Raithel, “Tunneling Resonances and Coherence in an Optical Lattice”, Phys. Rev. Lett. **88**, 173001 (2002).
15. T. H. Stievater, Xiaoqin Li, **J. R Guest**, D. G. Steel, D. Gammon, D. S. Katzer, D. Park, “Wavelength modulation spectroscopy of single quantum dots”, Appl. Phys. Lett. **80**, 1876 (2002).
16. **J. R. Guest**, T. H. Stievater, Gang Chen, E. A. Tabak, B. G. Orr, D. G. Steel, D. Gammon, D. S. Katzer, “Near-field coherent spectroscopy and microscopy of a quantum dot system”, Science **293**, 2224 (2001).
17. S. K. Dutta, D. Feldbaum, A. Walz-Flannigan, **J. R. Guest**, G. Raithel, “High-angular-momentum states in cold Rydberg gases”, Phys. Rev. Lett. **86**, 3993 (2001).
18. S. K. Dutta, **J. R. Guest**, D. Feldbaum, A. Walz-Flannigan, G. Raithel, “Ponderomotive optical lattice for Rydberg atoms”, Phys. Rev. Lett. **85**, 5551 (2000).
19. N. H. Bonadeo, A. S. Lenihan, G. Chen, **J. R. Guest**, D. G. Steel, D. Gammon, D. S. Katzer, D. Park, “Single quantum dot states measured by optical modulation spectroscopy”, Appl. Phys. Lett. **75**, 2933 (1999).
20. R. B. Miles, G. L. Brown, W. R. Lempert, R. Yetter, G. J. Williams Jr., S. Bogdonoff, D. Natleson, **J. R. Guest**, “Radiatively driven hypersonic wind tunnel”, AIAA Journal **33**, 1463 (1995).

Conference Proceedings:

- A. Walz-Flannigan, D. Feldbaum, S. K. Dutta, **J. R. Guest**, G. Raithel, “L-changing collisions in cold Rydberg gases”, in Photonic, Electronic and Atomic Collisions (XXII ICPEAC Proceedings), eds. J. Burgdoerfer, J. S. Cohen, S. Datz and C. R. Vane, Rinton Press, Princeton (2002).

Book Chapters:

- Gang Chen, T. H. Stievater, **J. R. Guest**, D. G. Steel, D. Gammon, C. Piermarocchi, Po-Chung Chen, L. J. Sham, “Optical Spectroscopy and Manipulation of Single Quantum Dots”, in Quantum coherence, correlation and decoherence in semiconductor nanostructures, ed. T. Takagahara, Academic Press, San Diego (2003).

Invited Presentations:

1. **J. R. Guest**, “Cold and trapped Rydberg gases and plasmas in strong magnetic fields”, AMO Seminar, SUNY, Stony Brook, 2004.
2. **J. R. Guest**, “Rydberg gases and plasmas: cold, trapped, and strongly magnetized”, Physics Department Colloquim, William and Mary, 2004.
3. **J. R. Guest**, “Strongly magnetized ultracold plasmas and Rydberg gases”, Seminar, NIST, Gaithersburg, 2004.
4. **J. R. Guest**, “Strongly magnetized ultracold plasmas and Rydberg gases”, FOCUS Seminar, University of Michigan, 2003.
5. **J. R. Guest**, “Strongly magnetized ultracold plasmas and Rydberg gases”, Seminar, Argonne National Laboratory, 2003.

6. **J. R. Guest**, "Cold Rydberg atoms - new venues in quantum information, atom trapping, and plasma physics", Quantum Information Science Seminar, University of Illinois Urbana-Champaign, 2003.
7. **J. R. Guest**, "Cold Rydberg atoms - new venues in plasma physics, atom trapping, and quantum information", Physics Department Colloquim, University of Oregon, 2003.
8. **J. R. Guest**, "Cold atom physics: Rydberg gases and plasmas", Physics Department Colloquim, Auburn University, 2002.
9. **J. R. Guest**, B. K. Teo, T. Cubel, D. Feldbaum, G. Raithel, "Towards a dipole blockade in a cold Rydberg gas", FOCUS Kickoff Conference, University of Michigan, 2002.
10. **J. R. Guest**, N. H. Bonadeo, G. Chen, A. S. Lenihan, T. Stievater, J. Erland, D. G. Steel, D. Gammon, D. S. Katzer, D. Park, "Nano-optics: probing one exciton at a time", MRS Spring Meeting, 1999.

Presentations:

1. **J. R. Guest**, J.-H Choi, E. Hansis, G. Raithel, "Strongly magnetized Rydberg gases and plasmas", DAMOP, 2004.
2. A. Walz-Flannigan, **J. R. Guest**, J.-H. Choi, G. Raithel, "Influence of thermal blackbody radiation on the evolution of a cold Rydberg gas", DAMOP 2004.
3. J.-H Choi, **J. R. Guest**, E. Hansis, A. Povilus, G. Raithel, "Laser-cooling and trapping near 3 Tesla", DAMOP, 2004.
4. A. Walz-Flannigan, **J. R. Guest**, G. Raithel, "Cold Rydberg gas dynamics and the trapping of cold Rydberg atoms", QELS 2003.
5. **J. R. Guest**, J.-H Choi, A. Povilus, G. Raithel, "Cold Rydberg atoms in strong magnetic fields", DAMOP, 2003.
6. B.-K. Teo, D. Feldbaum, T. Cubel, **J. R. Guest**, P. R. Berman, G. Raithel, "High resolution, nonlinear spectroscopy of cold Rydberg atoms", DAMOP 2003.
7. **J. R. Guest**, M. T. Gastner, G. Raithel, "Cold Rydberg atom gases and plasmas in strong magnetic fields", DAMOP, 2002.
8. B. K. Teo, **J. R. Guest**, G. Raithel, "Tunneling resonances and coherence in a gray optical lattice", DAMOP, 2002.
9. A. Walz-Flannigan, **J. R. Guest**, G. Raithel, "Cryogenic MOT and trap for cold Rydberg atoms", DAMOP, 2002.
10. **J. R. Guest**, S. K. Dutta, A. Walz-Flannigan, D. Feldbaum, G. Raithel, "Ponderomotive optical lattices for trapping Rydberg atoms", DAMOP, 2001.
11. A. Walz-Flannigan, S. K. Dutta, **J. R. Guest**, D. Feldbaum, G. Raithel, "L-mixing collisions between Rydberg atoms and slow charged particles", DAMOP, 2001.
12. D. Feldbaum, S. K. Dutta, A. Walz-Flannigan, **J. R. Guest**, G. Raithel, "Spectroscopic electric-field measurement in cold plasmas", DAMOP, 2001.
13. G. Raithel, B. K. Teo, **J. R. Guest**, "Effect of tunneling resonances on the paramagnetism of an optical lattice", Postdeadline QELS, 2001.

14. **J. R. Guest**, S. K. Dutta, D. Feldbaum, A. Walz-Flannigan, G. Raithel, “Ponderomotive optical lattices: a method for trapping Rydberg atoms”, QELS, 2001.
15. D. Feldbaum, S. K. Dutta, A. Walz-Flannigan, **J. R. Guest**, G. Raithel, “Long-lived states in cold Rydberg gases”, QELS, 2001.
16. **J. R. Guest**, T. H. Stievater, D. G. Steel, D. Gammon, D. S. Katzer, D. Park, “Nonlinear near-field spectroscopy and microscopy of single excitons in a disordered quantum well”, QELS, 2000.
17. **J. R. Guest**, T. H. Stievater, A. S. Lenihan, G. Chen, D. G. Steel, D. Gammon, D. S. Katzer, D. Park, “Coherent near-field spectroscopy and microscopy of single quantum dots”, QELS, 1999.
18. K. Ferrio, **J. R. Guest**, D. G. Steel, “Electronic Raman coherence in GaAs: state-specific scattering processes”, QELS, 1996.

Posters:

1. T. Cubel, K.-B. Teo, **J. R. Guest**, V. Malivosky, P. Berman, G. Raithel, “Coherent population transfer into the ^{85}Rb 44D Rydberg state”, DAMOP, 2004.
2. A. Walz-Flannigan, **J. R. Guest**, G. Raithel, “Cold Rydberg gas dynamics”, ICPEAC, Sweden (2003).
3. **J. R. Guest**, J.-H. Choi, G. Raithel, “Cold Rydberg atoms and plasmas in strong magnetic fields”, Gordon conference on Atomic Physics, 2003.
4. J.-H. Choi, **J. R. Guest**, G. Raithel, “Cold Rydberg atoms and plasmas in strong magnetic fields”, QELS, 2003.
5. S. Olson, B. K. Teo, **J. R. Guest**, G. Raithel, “Continuous-wave atom laser”, FOCUS Kickoff, 2002.
6. **J. R. Guest**, M. T. Gastner, A. Povilus, G. Raithel, “Superconducting atom and plasma trap for strong magnetic field studies”, FOCUS Workshop, 2002.
7. Xiaoqin Li, T. H. Stievater, **J. R. Guest**, D. G. Steel, “Optical absorption measurements from single semiconductor quantum dots”, QELS, 2001.
8. **J. R. Guest**, T. H. Stievater, A. S. Lenihan, D. G. Steel, D. Gammon, D. S. Katzer, D. Park, G. Khitrova, H. M. Gibbs, “Near-field coherent spectroscopy and microscopy of single localized excitons: mapping the center-of-mass wavefunction”, Workshop on the Physics of Quantum Dots for Quantum Computing, 1999.

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